

# The Cleco

Experimental Aircraft Association • Chapter 393 • Concord, CA

Mall to: EAA Chapter 393 P.O. Box 272725 Concord, CA 94527-2725

## NOVEMBER 1994

### YOUR 1994 OFFICERS

PRESIDENT	Fred Egli 935-7551
VICE PRESIDENT	Lisle Knight 658-6629
SEC/TREASURER	Louis Goodell 682-4198
EDITORS	Ken & Linda McKenzie 283-3119

### MEMBERSHIP MEETING

November 30, 1994 (PLEASE NOTE: This is the last Wednesday of the month) @ 7:30pm, Old Buchanan Terminal Building, Concord Airport. Please wear your badges to help those of us who have trouble remembering everyone's name. Bring chairs since we never seem to have enough.

### BOARD MEETING

The board meeting is scheduled for 7:30 p.m., Wednesday, December 7 at Fred Egli's house. If you are interested in attending or have a matter you wish to discuss, please call Fred.

### NOVEMBER PROGRAM

This month's presenter is Brian Shul, a retired SR-71, Blackbird, driver. Brian is now an author of many books and other publications describing his experiences during his high altitude reconnaissance flights. His presentation will include a discussion of those adventures, along with the many slides he has collected on those flights.

This should be a fascinating and very informative evening. I do hope I will see as many of you there as possible for Brian's presentation.

*Lisle Knight*

### MINUTES OF THE CHAPTER MEETING held October 26, 1994

The meeting was called to order at 1930 hours, Fred Egli presiding. The minutes of the August meeting were approved as submitted in the October 1994 Cleco.

Fred introduced Blake Steele, who came to the Bay Area for a business conference from Ottawa, Canada. Blake announced over the Internet that he was interested in seeing some homebuilts while he was here, so Ken invited him to attend our meeting.

The first order of business was a discussion of the price for the Christmas Party. It was moved, second and passed to drop the price to \$20. Any additional costs would be picked up by the chapter treasury.

The Savings balance is approximately \$2,690 and the Checking balance is approximately \$550.

The second super-duper raffle was held. Orchard Supply Hardware donated half of the prizes. The winners were Randy Cutshaw, Tim Glenn, Frank Storm, Dick Rihn, Doc Watson, Glenn Werner, Don O'Neill, Ed Perez, Phil Jenkins, Toni Tiritilli and Gordon Bowen.

### WELCOME NEW MEMBERS

We would like to extend a warm welcome to Randy Cutshaw, who joined Chapter 393 at our October meeting.

### SUMMARY OF NOVEMBER'S PROGRAM

Brien Seeley, President of the CAFE Foundation, spoke to us about the Foundation's work developing the testing equipment that is being used in the EAA/CAFE Aircraft Performance Report program.

Brien brought transparencies highlighting the theories that are being verified by the Zero Thrust Glide Testing. In addition Brien showed a video tape of the test flights done over the Mendocino coast with the propeller removed from the CAFE Foundations Cessna 150.

## CONGRATULATIONS!!!

Rick Lambert announced that the SX300 has made its first flight. It apparently "flies better than advertised."

## THE NEW RAFFLE

by Larry K. Laughlin

The NEW and IMPROVED EAA Chapter #393 raffle has begun with a slightly aft CG condition. Its not that I'm dragging my butt, however I missed a few of the first meetings where the raffle was supposed to kick-off. Consequently, I forgot some of the first ideas too, like issuing each meeting "attendee a free raffle ticket" and getting the "ticket for a tip" routine underway. Oh well, we might as well keep it simple and hang on to those other ideas until next year, maybe. Now that we're into it, I would have to say the New Raffle concept is working. We're having fun, the prizes are pretty good, and it may start covering its own costs pretty soon. I've developed a donation letter with a receipt on the bottom for anyone company wishing to participate, but here's the rub. I would like some of our club members to assist me in obtaining donations to the cause. I've touched bases with OSH, Home Depot, and Neds Auto Paints and all have agreed to kick-in, in trade for honorable mention in our newsletter, but we still need more participants. I know some of you know companies that would chip in, just for the asking. So listen, if you work for a company or know of one that would like to donate \$35.00 or more to our club raffle, we'll publish their business card in the Cleco and talk it up accordingly. It doesn't have to be tools and paint either. Anything goes with our crowd; donations can be gift certificates, free biannual flight reviews, money (we'll convert money into something aircraft related), etc. Just give me a call at (510) 758-3533 and I'll mail you the donation letter & receipt sheet.

This month, store manager Joe Ignaitis of the Concord "Orchard Supply Hardware" store donated \$35.00 worth of tools and such. As with any of our donators, please let him know how much we appreciate his contribution next time your in his store.

## **OSH Orchard Supply Hardware**

**JOE IGNAITIS**  
STORE MANAGER

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## MINUTES OF THE BOARD MEETINGS

The October 5, 1994, board meeting was called to order at Fred Egli's house at approximately 1930 hours. In attendance were Fred Egli, Lisle Knight, and Ken and Linda McKenzie.

Lisle Knight was following up on putting together a committee for the Christmas Party.

## FROM THE INTERNET

From: leishman@hellcat.eng.umd.edu. (leishman)  
Subject: Rare earth magnets  
Date: 4 Nov 1994 16:53:48 GMT

Anyone have any thoughts/experiences with the use of rare earth magnets on oil filters? Apparently, they are attached in a group of 4 magnets (and cost about \$40) onto the outside of a standard spin-on filter, and can trap ferrous particles down to about 3 microns. Kas Thomas (TBO Advisor Mag) seems to be a big fan, but I haven't seen any hard evidence (e.g. oil analysis or other wear comparison) that shows their worth. Anyone tried them?

-----  
From: lpmeditor@aol.com (LPM Editor)  
Subject: Re: Rare earth magnets  
Date: 7 Nov 1994 20:50:16 -0500

Personally, I don't believe in them. I think that about all they're going to do is scare lots of people into premature engine work. Let's face it, folks: If micro-fine metal particles too small to be filtered out were any real hazard to your engine, wouldn't they have been implicated in some sort of failure mode over the course of the last half century? I've never heard of any engine damage being traced to such small stuff.

Will it provide any early warning of impending failure? Not likely.

Consider that the bulk of your engine is aluminum, thus non-magnetic. So, most metal particles are no going to stick to the magnets. If steel parts begin shedding particles that small, you're now faced with a decision to either fly on or tear down, because you'll never figure out where the particles are coming from based on such micro-fine bits.

No, in the end I believe you're better off skipping the rare-earth magnet bit. It won't help keep your engine any cleaner, it won't help you diagnose impending failure, and it will scare the daylight (and money) out of you needlessly.

JL  
LPM Editor

# SX300 FIRST FLIGHT: FLAWLESS!

UNINTENTIONAL FIRST FLIGHT OCT. 19  
PICTURES TAKEN NOV. 12 - 300 HP ENGINE  
CRUISE 280 MPH, TOP SPEED 308 MPH @ 7500'



- RICH HARRIS AT CONTROLS OF GÖERDE'S SX  
WITH NORM SPITZER/GLASSAIR FT AS CHASE.



-PREPARING  
FOR TAKE-OFF  
ON 32R.

- COMING HOME  
AFTER SUCCESSFUL  
FLIGHT(S).  
- BRAVOS TO RICK  
LAMPERT, BUILDER;  
GERD BODE - OWNER;  
RICH HARRIS, TEST PILOT.



From: Charles.K.Scott@dartmouth.edu (Charles K. Scott)  
Subject: Poly Epoxy; explanation from Stan Montgomery  
Date: 21 Oct 1994 13:12:54 GMT

### Poly Epoxy characteristics explained

I have always felt that the best way to get accurate information on products or construction practices or almost any question is to go to the source and ask the person who invented, constructed, formulated or postulated whatever created the interest. With this in mind, after a question was posed about the viability of Poly Epoxy, I faxed Alexander Aeroplane and asked Ron Montgomery, the formulator of this epoxy if he would mind explaining the properties he was seeking when he created it. Obviously, Ron has a not insubstantial stake in this product, he thinks it is a big step ahead in epoxies and he was happy to write a comprehensive explanation and fax it to me. Stan explained that while Nat Puffer is an expert designer and constructor of composite aircraft, he may not be an expert in epoxy formulation or be fully informed of recent advances in epoxy testing techniques. Mr. Puffer may feel differently, probably does but I didn't speak with or contact him. Stan also said that there are many ways to look at properties of epoxies and manufacturers have been known to take the best looking figures for their products regardless of the relevance of these figures to actual hands on use. In other words the figures look good or can make other resins look bad but they don't necessarily mean anything in the real world.

Following, with minor editing and typo corrections is Stan's explanation, I have additional comments which I've enclosed in brackets:

There are two areas of properties that concern me in epoxy. Typically people only look at the mechanical properties and fail to look at the toughness properties which give the resin the ability to have longevity. Lets take a closer look at the situation.

"Mechanicals", are those properties characteristic of stress/strain relationships within a resin or laminate. As such, they include tensile, compressive, and flexural strengths along with their respective moduli. These properties are well understood by builders and designers alike. They are conceptually easy to understand as they pertain to strength. Various resins are often evaluated by comparing their respective mechanicals. Generally, the basis of comparison is "stronger equals better".

Toughness properties are not as well understood. They have to do with interlaminar strengths such as peel and shear, fatigue resistance, impact strength, and fracture behavior. These all point to the durability of the resin and resistance to delamination of the laminate. That is, a tougher resin would be expected to have a longer service

life than one that is less tough, mechanicals being equal. The tougher resin could be expected to be put through many more stress/strain cycles with lower loss of initial mechanical properties than the less tough resin and resist microcracking and interfacial failure. [what Stan is saying here is that resins in the past have been very hard, that's what characterized them, their ability to resist bending and flexing over the long term was a property not available until now] Until recently there has been no simple quantitative measure of these properties in an all encompassing way that would allow various resins to be compared on a meaningful basis. However, several years ago a concept of interlaminar fracture toughness was developed that can be used to compare various reinforce plastics using different resins. The use of this tool will allow naval architects and engineers as well as aeronautical engineers to better design laminates for their intended use.

The toughness of a laminate is the critical value of the strain energy release rate,  $G$ , required to cause a delamination crack to grow under steady state conditions. Physically, it represents the rate of energy lost per unit of interlaminar surface area created when delamination occurs. In practical terms it is the ability of the laminate to absorb and dissipate strain energy in the area of cracks.

If we look at a graph we can see that typically as the mechanical properties increase, the toughness properties decrease.

[a graph, in this format is almost impossible to create so I can only describe what the graph looks like. Stan drew a standard graph with a vertical and horizontal axis. The vertical represented mechanical properties and the horizontal the toughness properties. In the past, all resins scored high on the mechanical properties scale so they all were high up on the vertical line but hadn't moved very far to the right on the toughness scale. What Stan has created is a resin that while it's slightly lower on the mechanicals scale, it's substantially higher on the toughness properties scale. So if you're looking at the scale, the intersection of this resin occurs a little lower but way to the right of the typical resin.]

Mechanical properties



Toughness properties

What Poly Epoxy has done is bridge the gap and get as high of mechanical properties and toughness properties as possible in a single resin system. therefore providing a superior resin system for both industrial and experimental

applications. We often open a package of vacuum sealed meats to find that the plastic only stretches and does not fracture or break.... this is toughness, yet has very low mechanical properties. [The opposite effect would be a plate of glass which bends very little and shatters when bent too far, this would be a low toughness material but high mechanical properties]

The advantages of a toughened system are very clearly demonstrated by simply making a laminate with a toughened system and one with a normal resin system and hitting them with a hammer. [The standard resin shatters under this test but Poly Epoxy does not] Likewise, a neat resin sample (resin only, no reinforcement) even better demonstrates this property. Pour up approx. 2 to 4 fluid oz. of any other resin system and the same in Poly Epoxy and let cure in the cup. Peel the paper away after cured and throw at a concrete surface with all your might. Low and behold you have now demonstrated toughness properties. [As before, the standard resin would shatter but Poly Epoxy doesn't]

If we look at practical applications in our usage in experimental aircraft the reinforcement material (glass) is designed to take the load and has much higher mechanicals than the resins. The purpose of the resin is to act as a binder to hold the fibers in proper alignment and to provide a protective barrier for the fibers. With this in mind is (would) not a toughened system that balances mechanical and toughness properties be the resin system of choice of those who are educated and look at the complete picture?

I could elaborate more on the subject, but you can get a good idea from this.... look at the graph and you will find that Poly Epoxy is a unique blend of Mechanical and Toughness properties that allow us to chronologically benefit from our labors and the usage of Poly Epoxy. I would hate to think that one would spend 3 to 5 years or more building a project only to find that it is greatly decreasing in strength as it is exposed to stress/strain cycles. For so little more in price we can gain so much more in performance.

I hope this answers the Nat Puffer dilemma and resins.

Sincerely yours

Stan Montgomery

[Stan further stated to me that he could have gone into a more comprehensive explanation but felt that there was a real danger of getting too complicated and therefore losing the readers interest.]

Comment is welcome

Corky Scott

From: sidlloyd@aol.com (SidLloyd)

Subject: Composite question (PolyEpoxy)

Date: 24 Oct 1994 09:38:07 -0400

I just got back from the two day Alexander Aeroplane Builders Forum and give it a double thumbs up. I've been building my CozyIV for almost 3 years now. Had I been able to attend this course prior to starting, I would have saved hundreds of hours of time, thousands of dollars in expense, and probably 20-40 pounds of weight in my project. The good news is I will be implementing the skills I learned to make the rest of the project go smoother. I would HIGHLY recommend this course to novices or experienced builders. I am also planning on attending the new advanced composites course they will be offering starting in '95. They will also have an intro course for "builders assistants" - one of the goals of which is to decrease the frequency of AIDS (Aircraft Induced Divorce Syndrome).

By the way - did you know that most builders who complete a project start another?

Anyway, I previously posted a question about the viability of PolyEpoxy, Alexander Aeroplane's new epoxy, as Nat Puffer had recommended not using it due to low mechanical properties. Corky posted a follow-up from Stan Montgomery, the chemist who developed the formula. Stan taught the forum this weekend and we discussed this extensively.

I agree that the PolyEpoxy is much tougher than others. This is due to .5-1 micron bits of rubber added as part of the formula. These rubber bits act much as stop-drilling a crack in aluminum when a micro-crack forms in epoxy. Stan said that resin strength can be reduced as much as 40% in a long period of time due to micro-cracks. It was pretty amazing to watch Stan pound on a laminate as hard as he could with a hammer and not have it shatter. However, there is still the difference in mechanical properties.

Stan mentioned that epoxys such as 2410 (Saf-T-Poxy) or 2427 have the following mechanical properties:

tension 18 KSI  
compression 40 KSI

PolyEpoxy rated at

tension 16 KSI  
compression 28 KSI

(I don't have my notes with me but I believe that the numbers are correct. Glass fiber is about 400-450 KSI).

My concern is with the mechanicals. The Cozy was designed around 2410. (Though my hunch is that Nat



didn't do any actual engineering determination, just scaled up Rutan's longEZ plans.) For all you composite gurus out there, would there need to be extra laminate layers needed for this difference in mechanical properties? Stan also seemed to doubt the 2410 compressibility numbers as that would mean it would be less compressible than toughened steel.

Any advice would be appreciated.

Sid Lloyd

CozyIV with rear windows going in.

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From: aboyd@qnx.com (Andrew Boyd)

Subject: G tolerance

Date: Wed, 19 Oct 94 12:39:22 GMT

Dave Mould <davem@hbmltd.demon.co.uk> wrote:

> As an ab-initio aerobatic trainee as well, I first found  
> that I began to grey-out & had slight tunnel-vision in  
> high-G maneuvers.

>

> I then read an aerobatic training book (can't remember  
> the author), which mentioned these very symptoms,  
> and gave the following counter-measure.

>

> 1) Eat before the flight to provide a full stomach &  
> good blood-sugar

>

> 2) Tense your stomach muscles "hard" before & during  
> high-G

A very very old way of dealing with G is as follows:

When you feel a bit of G, scrunch your toes up. A bit more G, tense your calves as well. More G, tense your upper legs, too.

More G, now tense your butt (gluts) as well.

Lotsa G, now tense your stomach muscles, pecs and lats.

You grey/black out because the blood is being drained from your head: I have used the above technique, in the absence of a G suit, to stay conscious in the range of 7 to 8 positive Gs. Like a toothpaste tube, you use your muscles to squeeze the blood up out of your body to your brain.

Curiously, the above technique seems to be guarded like the crown jewels in civilian circles.

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#include <std.disclaimer>

From: markm@XMission.com (Mark A. Matthews)  
Subject: Re: What's the FCC requirement for hand held transceivers ?

Date: Sat, 05 Nov 1994 08:52:10 -0700

In article:

<1994Nov5.032608.124991@slate.mines.colorado.edu>, mbarkah@slate.mines.colorado.edu (Ade Barkah) wrote:

> I'm interested in buying a handheld transceiver,  
> probably the one made by King. Do I need an FCC  
> radio operator's license to operate this unit ? Or is the  
> range on these handhelds not far enough to require  
> one ?

If you don't use the transmit portion of the radio, you don't need a license.

If you use the transmit portion of the radio while in (or otherwise somehow in contact with) an aircraft that has a radio license, the handheld is covered by that license and you don't need an additional one.

If you plan on using the transmit portion of the radio independent of an aircraft, or not otherwise covered by some entity's license, you need to apply for a license. The manufacturer should be nice enough to include the appropriate application. Filling out the application such that the FCC actually grants the license is an exercise left to the reader - hint: the conditions for issuance are biased heavily towards training and use by required ground crew.

The \$110 fee is likely to discourage anyone from bothering with paperwork at this time.

Here's one to make a radio inspector's stomach churn: If I'm walking around an airport with a handheld (not otherwise licensed), and wish to transmit, all I need to do is find an aircraft with a radio license (by peeking in the window to see the license), climb up on the wing/strut/step and transmit, ID'ing with that aircraft's N-number, right? :-)

--

-Mark

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#### UNCLASSIFIEDS

Pete Wiebens has hangar space for rent. Call 933-7517.

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FOR SALE: IO-360-A1B (fuel injected, 200hp) for sale "at more than a fair price." Call John M. Agee, M.D. at (916) 484-7038.

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FOR SALE: Lightweight starter for Lycoming engine. Manufactured and STC'ed by Lycoming. New; \$450. Call Mike Parker, (510) 685-4809 (leave message).

## HUMOR OVER THE INTERNET

From: jlo@gomez.sc.intel.com (Jeffrey Lo)  
Subject: Re: Heard on the Air, was Re: "Cherokee" vs ...  
Date: 7 Nov 1994 05:18:28 GMT

Charles A Smith (cap@selway.umd.edu) wrote:

>> I recently purchased a share in a C-210. On my first  
>> flight, as I approached the Class D airspace of my  
>> home field, I called in:  
  
>> Me: Tower, Cessna 5907F, blah, blah  
  
>> Tower: Cessna 07F, report left base 29, expedite for  
>> following traffic, a Metroliner inbound from the east.  
  
>> Me: 07F, (so I put the nose down, and leave the  
>> gear up for the moment)  
  
>> Tower: Cessna 07F, say type aircraft.  
  
>> Me: Tower, 07F is a Cessna 210.  
  
>> Tower: Oh, that would explain why your  
>> groundspeed is 170 knots. Disregard: previous  
>> instruction. Metroliner no factor.  
  
>> So, because of that, I now announce as "Centurion  
>> 5907F"

-----  
This reminds me of my trip to OSH from SJC in 1992 in a Cessna 120. Occasionally, controllers would get a bit dyslexic when I would get handed off from one sector to another. I was approaching Salt Lake City and talking to approach. After a handoff I was just putting along looking out the window when I hear a call for a Centurion:

Appch: "Centurion blah blah blah"  
Hearing "Centurion", I didn't listen much to the number.  
Appch: (More insistent) "CENTURION 19N"  
Me: "Are you calling Cessna 1819N?".  
Appch: "Yes, where have you been?"  
Me: "I heard "Centurion" and didn't listen to the tail number. I'm not a Cessna 210, I'm a Cessna 120."  
*...a pregnant pause on the radio...*  
Appch: "Ohhhhhh. OK."  
Me: "I'll bet you were wondering why I was moving so slowly."  
Appch: "Yeah, it looked like you were going backwards for while!"

--  
Jeff Lo  
1963 Pitts Special S1A N8L  
1946 Cessna 120 N1819N

From: MAJONES@SCIENCE.watstar.uwaterloo.ca (M Jones)  
Subject: Re: Heard on the Air, was Re: "Cherokee" vs ...  
Date: Tue, 8 Nov 1994 16:13:31 GMT

And this in turn reminds me of a funny little incident.

It was a beautiful spring day, clear, 15+ visibility. I had just finished my run up and checked the approach to the active runway. Seeing that the approach was clear I switched from ground to tower frequency to call for take off clearance. Almost the instant I dialed in the tower I heard this:

ac: "London Tower Bravo Quebec short final 33 full stop"

This made me worry about my eyesight as I sure a hell did not see anything on short, medium or long final. My worries were put to rest a few seconds later by:

tower: "Bravo Quebec, negative visual contact. Pull up go around"

I felt a little better. After all if the tower couldn't see him why should I? Anyways I called tower and got cleared for take off. On my way out of the zone I heard 2 repetitions of "short final" and "negative visual contact, pull up go around". After the third one the pilot responded:

ac: "Well LOOK OUT YOU WINDOW!. I'M RIGHT IN FRONT OF YOU!"

tower: (calmly)"Bravo Quebec, look down into the center of the runway pattern. Do you see a big white radar dome?"

*pregnant pause*

ac: "Uh..... London..... negative on the dome."

tower: "That's because you are overhead Waterloo Wellington. Their tower frequency is 125.00. I think they want to talk to you."

ac: (quietly) "bravo quebec"

Waterloo Wellington is a controled airport 50nm NE of London

--  
M Jones

-----  
From: ron@topaz.sensor.com (Ron Natalie)  
Subject: Re: 727 with Winglets  
Date: 1 Nov 1994 15:51:44 GMT

Phil Wood (woodp@zilker.net) wrote:

> Amazing, eh? Delta has two modified B727-232, ship  
> numbers N511DL and N512DL.

> The aftermarket guy is claiming better range and  
> improved fuel economy. No word yet on the success  
> or failure of the experiment....

Great, Part 121 Experimental aircraft. Do they have the little placard by the door with the Passenger Warning notice on it?

-Ron



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(415) 969-6500

Reply to Oakland Office

**The C  eco**

Experimental Aircraft Association  
Chapter 393  
P.O. Box 272725  
Concord, CA 94527-2725



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Bob Belshe  
122 Fairfield PL.  
Moraga , Ca. 94556